

## ABSTRACT

The invention is directed to method of preparing metal fluoride single crystals and particularly to crystals where the metal is calcium, barium, magnesium or strontium, or a mixture thereof. The invention uses a decreasing fast cooling profile and an increasing slow cooling profile for the hot zone and the cold zone, respectively, after crystal formation during cooling from melt temperatures to a first temperature. A substantially constant cooling rate is then applied to the both zones during cooling from the first temperature to a final temperature, usually room temperature. It has been found that the substantially constant cooling rate during the annealing process results in crystals having improved homogeneity and birefringence.